

10-17-00

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Hubert VATTEMMENT  
Docket: 11123.19US01  
Title: GROUT FOR MAKING WATERTIGHT SCREENS

JC907 U.S. PTO  
09/691325  
10/18/00



CERTIFICATE UNDER 37 CFR 1.10

'Express Mail' mailing label number: EL 674898105US

Date of Deposit October 18, 2000

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By:   
Name: Linda McCormick

BOX PATENT APPLICATION  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

We are transmitting herewith the attached:

- Transmittal sheet, in duplicate, containing Certificate under 37 CFR 1.10.
- Utility Patent Application: Spec. 4 pgs; 35 claims; Abstract 1 pg.
- 1 sheet of formal drawings
- An unsigned Combined Declaration and Power of Attorney
- Other: Preliminary Amendment; Communication Regarding Priority Claim; French Search Report
- Return postcard
- PAYMENT OF THE FILING FEE IS BEING DEFERRED.**

MERCHANT & GOULD P.C.  
P.O. Box 2903, Minneapolis, MN 55402-0903  
(612) 332-5300

By:   
Name: John J. Gesens  
Reg. No.: 33,112  
Initials: JJG:jw



S/N Unknown

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: VATTEMENT Serial No.: Unknown

Filed: Concurrent herewith Docket No.: 11123.19US01

Title: GROUT FOR MAKING WATERTIGHT SCREENS

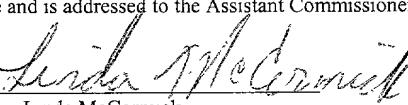
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By   
Name. Linda McCormick

PRELIMINARY AMENDMENT

BOX PATENTS APPLICATION

Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

In connection with the above-identified application filed herewith, please enter the following preliminary amendment:

IN THE TITLE

On page 1, line 1, please insert the title —GROUT FOR MAKING  
WATERTIGHT SCREENS—.

IN THE CLAIMS

On page 5, line 1, please replace "CLAIMS" with —WHAT IS CLAIMED IS:—.

Please amend claims 3-8 as follows:

In claim 3, line 1, please replace "claim 1 or 2" with —claim 1—.

In claim 4, line 1, please replace "one of claims 1 to 3" with —claim 1—.

In claim 5, line 1, please replace "one of claims 1 to 4" with —claim 1—.

In claim 6, line 1, please replace "one of claims 1 to 5" with —claim 1—.

In claim 6, line 2, please add —the group consisting of— between "from" and "sodium".

In claim 6, lines 3-4, please replace "slaked lime, a mixture of these compounds, or Portland cement" with —slaked lime and mixtures of these compounds—.

In claim 7, line 1, please replace "one of claims 1 to 6" with —claim 1—.

In claim 8, line 1, please replace "one of claims 1 to 7" with —claim 1—.

Please cancel original claims 9-11 without prejudice or disclaimer of the subject matter thereof and add the following new claims 12-38 to the application:

12. (New) The grout of claim 1, in which the activating agent is Portland cement.

13. (New) The grout of claim 1, in which the slag has a Blaine specific surface area of about 2,500 to about 4,500 cm<sup>2</sup>/g.

14. (New) An excavation fluid, which comprises a grout consisting of a mixture comprising water, a natural or modified clay, a blast furnace slag having a maximum grain size of between about 50 µm and about 100 µm, and an activating agent.

15. (New) The excavation fluid of claim 14, in which the slag has a maximum grain size equal to about 80 µm.

16. (New) The excavation fluid of claim 14, in which the slag has a CaO/SiO<sub>2</sub> weight ratio of between about 1.10 and about 1.35.

17. (New) The excavation fluid of claim 14, in which the slag has a chemical modulus of greater than about 500.

18. (New) The excavation fluid of claim 14, in which the slag has a Blaine specific surface area of about 2,500 to about 4,500 cm<sup>2</sup>/g.

19. (New) The excavation fluid of claim 14, in which the modified clay is bentonite.

20. (New) The excavation fluid of claim 14, in which the activating agent is a compound selected from the group consisting of sodium hydroxide, potassium hydroxide, sodium or potassium (bi)carbonate, gypsum, quicklime, slaked lime and mixtures of these compounds.

21. (New) The excavation fluid of claim 14, in which the activating agent is Portland cement.

22. (New) The excavation fluid of claim 14, in which the mixture comprises from about 1 % to about 10 % by weight of activating agent with respect to the weight of the blast furnace slag.

23. (New) The excavation fluid of claim 14, in which the grout has a cement/water weight ratio of between about 0.1 and about 0.25.

24. (New) A method of making a watertight screen which comprises carrying out perforation with a grout consisting of a mixture comprising water, a natural or modified clay, a blast furnace slag having a maximum grain size of between about 50 µm and about 100 µm, and an activating agent.

25. (New) The method of claim 24, in which the slag has a maximum grain size equal to about 80 µm.

26. (New) The method of claim 24, in which the slag has a CaO/SiO<sub>2</sub> weight ratio of between about 1.10 and about 1.35.

27. (New) The method of claim 24, in which the slag has a chemical modulus of greater than about 500.

28. (New) The method of claim 24, in which the slag has a Blaine specific surface area of about 2,500 to about 4,500 cm<sup>2</sup>/g.

29. (New) The method of claim 24, in which the modified clay is bentonite.

30. (New) The method of claim 24, in which the activating agent is a compound selected from the group consisting of sodium hydroxide, potassium hydroxide, sodium or potassium (bi)carbonate, gypsum, quicklime, slaked lime and mixtures of these compounds.

31. (New) The method of claim 24, in which the activating agent is Portland cement.

32. (New) The method of claim 24, in which the mixture comprises from about 1% to about 10 % by weight of activating agent with respect to the weight of the blast furnace slag.

33. (New) The method of claim 24, in which the grout has a cement/water weight ratio of between about 0.1 and about 0.25.

34. (New) In a method for the preparation of a grout for making a watertight screen, said grout comprising a cement, the improvement comprising using a blast furnace slag having a maximum grain size of between about 50  $\mu\text{m}$  and about 100  $\mu\text{m}$  as the cement.

35. (New) The method of claim 34, in which the slag has a maximum grain size equal to about 80  $\mu\text{m}$ .

36. (New) The method of claim 34, in which the slag has a CaO/SiO<sub>2</sub> weight ratio of between about 1.10 and about 1.35.

37. (New) The method of claim 34, in which the slag has a chemical modulus of greater than about 500.

38. (New) The method of claim 34, in which the slag has a Blaine specific surface area of about 2,500 to about 4,500 cm<sup>2</sup>/g.

REMARKS

The above preliminary amendment is made to remove multiple dependencies from claims 3 - 8. Claims 1-8 and 12-38 are pending in this application.

Applicants respectfully request that the preliminary amendment described herein be entered into the record prior to calculation of the filing fee and prior to examination and consideration of the above-identified application.

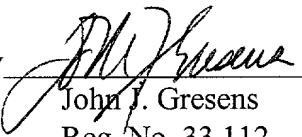
If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Applicants' primary attorney-of record, John J. Gresens (Reg. No. 33,112), at (612) 371-5265.

Respectfully submitted,

MERCHANT & GOULD P.C.  
P.O. Box 2903  
Minneapolis, Minnesota 55402-0903  
(612) 332-5300

Dated: October 18, 2000

By

  
John J. Gresens  
Reg. No. 33,112  
JJG:jjw

The present invention relates to the field of construction and building. More specifically, the invention relates to a grout for making watertight screens, as well as to a process which makes use of said grout.

It is known that ground blast furnace slag behaves as a real cement  
5 when a base such as sodium hydroxide or clinker for example is added thereto.

Thus, usually, mixtures of the following types are found on the market :

- slag + clinker in well defined proportions (Cement CLK CEM  
10 III/C, CHF CEM III/A or B ), or
- granulated slag + lime, intended for road works.

Making watertight screens is done by direct perforation with bentonite cement grout as excavation fluid. The perforation is done continuously from which comes the necessity of having a material which does not harden too  
15 quickly so as to prevent losses of grout on the excavation cuttings as well as the evacuation of grout which might have hardened prematurely. This specific method for watertight screens necessitates, with the materials which are currently available, the use of setting retarders and hardening retarders.

A good watertightness is in fact sought after during the making of  
20 watertight screens. The resistance is in general low and does not represent an essential criterion. In general, slag cements are used the composition of which generates grouts the rheology of which is difficult to control. The use of retarder additives is thus necessary to obtain a manoeuvrability which is compatible with the perforation with a grout.

25 The aim of the invention is to remedy these drawbacks. Thus, the objective of the invention is grouts which are particularly adapted to the making of watertight screens, in particular grouts which do not necessitate the addition of retarders.

Thus, the invention relates to a grout for making watertight screens  
30 which comprises a mixture of water, a natural clay or a modified clay such as bentonite, a blast furnace slag and an activating agent.

In accordance with the invention, said slag comprises grains the maximum size of which is between about 50 µm and about 100 µm, preferably equal to about 80 µm. The slag preferably has a Blaine specific surface area of about 2,500 to about 4,500 cm<sup>2</sup>/g.

5        Although the nature of the blast furnace slag is not particularly critical, it is preferable that it be of the basic type and that the CaO/SiO<sub>2</sub> weight ratio be between about 1.10 and about 1.35. A material which comprises 33 to 40% SiO<sub>2</sub>, 8 to 16% Al<sub>2</sub>O<sub>3</sub>, 39 to 44% CaO, and 4 to 9% MgO (in percentages by weight) as main components can be cited as an example of 10 a slag which can be used within the context of the present invention.

Furthermore, it is also preferable that the chemical modulus of the slag (CaO content (%) x Al<sub>2</sub>O<sub>3</sub> content (%)) be greater than about 500.

15        The activating agent enables the setting of the slag and is preferably a basic activating agent such as sodium hydroxide, potassium hydroxide, sodium or potassium (bi)carbonate, gypsum, quicklime, slaked lime or a mixture of these compounds. It is also possible to use Portland cement as activating agent.

20        In general, the amount of activating agent is between about 1 % and about 10 % by weight, with respect to the weight of the slag. An amount of activating agent equal to about 5 % by weight is particularly advantageous.

Advantageously, such a grout has a cement/water weight ratio (C/W) of between about 0.1 and about 0.25.

Under these circumstances, it is possible to obtain a grout having the following properties :

25        - a greater resistance for a same cement/water ratio,  
            - a better permeability at an equivalent dry matter content (as Figure 1 shows, which represents the evolution of the permeability as a function of the C/W ratio), and  
            - a very slow evolution of the rigidity which is well adapted to the 30 direct perforation with a grout. The low reactivity of the system makes it possible to totally do without the use of retarders. The suppression of such

additives enables the ground water to be respected by eliminating organic pollutant waste.

This grout can be used for underground work in contact with the ground water by virtue of its non-pollutant character, and it can be used for injection works and in the making of plastic concrete watertight screens.

The grout is prepared on the drilling site by mixing the components defined *supra*.

The invention will be better understood with the aid of the following Examples, which are given in a purely illustrative manner.

10 The following constituents are used in these Examples :

bentonite slurry : mixture of 1,000 l of water and 45 kg of sodic bentonite

slag : basic blast furnace slag having a CaO/SiO<sub>2</sub> weight ratio equal to 1.19 and a chemical modulus equal to 515

15 activating agent : CPA CEM I

retarder : mixed calcium/ammonium lignosulphate

accelerator : sodium silicate 35/37 °B

Example 1 : Influence of the maximum grain size of the slag upon the manoeuvrability time of the grout

Grout	Slag 40 µm	Slag 80 µm	Slag 120µm
manoeuvrability time	5 hours	5 hours	5 hours
Bentonite slurry	941 l	941 l	941 l
Slag	166.25kg	166.25 kg	166.25kg
Activating agent	8.75 kg	8.75 kg	8.75 kg
Retarder	3 l	0	0
accelerator	0	0	4 l

Example 2 : formulations for watertight wall

		invention	comparative
	Bentonite slurry	941 l	941 l
	Slag*	166 kg	
5	Activator ( CPA CEM I )	9 kg	
	CLK		175 kg
	Retarder		2 l
	Manoeuvrability time	5 h	5 h
	Resistance 28 days	1.2 MPa	1 MPa
10	Permeability	$5 \cdot 10^{-10}$ m/s	$4 \cdot 10^{-9}$ m/s

\*the slag has a continuous particle size ranging from 0 to 80 µm and a Blaine specific surface area equal to 4500

The grout in accordance with the invention, without retarder, has a manoeuvrability time which is identical to conventional grout comprising clinker (CLK) and a retarder, as well as a better resistance and a better permeability than conventional grout.

## CLAIMS

1. A grout for watertight screens, which consists of a mixture  
5 comprising water, a natural or modified clay, a blast furnace slag having a maximum grain size of between about 50 µm and about 100 µm, and an activating agent.

10 2. The grout according to claim 1, in which the slag has a maximum grain size equal to about 80 µm.

15 3. The grout according to claim 1 or 2, in which the slag has a CaO/SiO<sub>2</sub> weight ratio of between about 1.10 and about 1.35.

20 4. The grout according to one of claims 1 to 3, in which the slag has a chemical modulus of greater than about 500.

25 5. The grout according to one of claims 1 to 4, in which the modified clay is bentonite.

6. The grout according to one of claims 1 to 5, in which the activating agent is a compound selected from sodium hydroxide, potassium hydroxide, sodium or potassium (bi)carbonate, gypsum, quicklime, slaked lime, a mixture of these compounds, or Portland cement.

30 7. The grout according to one of claims 1 to 6, in which the mixture comprises from about 1 % to about 10 % by weight of activating agent with respect to the weight of the blast furnace slag.

8. The grout according to one of claims 1 to 7, which has a cement/water weight ratio of between about 0.1 and about 0.25.

9. A method of making a watertight screen in which the perforation is carried out with the aid of the grout as defined in one of claims 1 to 8.

5        10. Use of a blast furnace slag having a maximum grain size of between about 50 µm and about 100 µm for preparing a grout intended for making watertight screens.

10      11. Use according to claim 10, in which the blast furnace slag is as defined in one of claims 2 to 4.

ABSTRACT

The invention relates to a grout for making watertight screens which comprises a mixture of water, natural or modified clay, specific blast furnace slag and an activating agent.

5 The invention also relates to a process which makes use of said grout, as well as the use of a specific blast furnace slag for preparing said grout.

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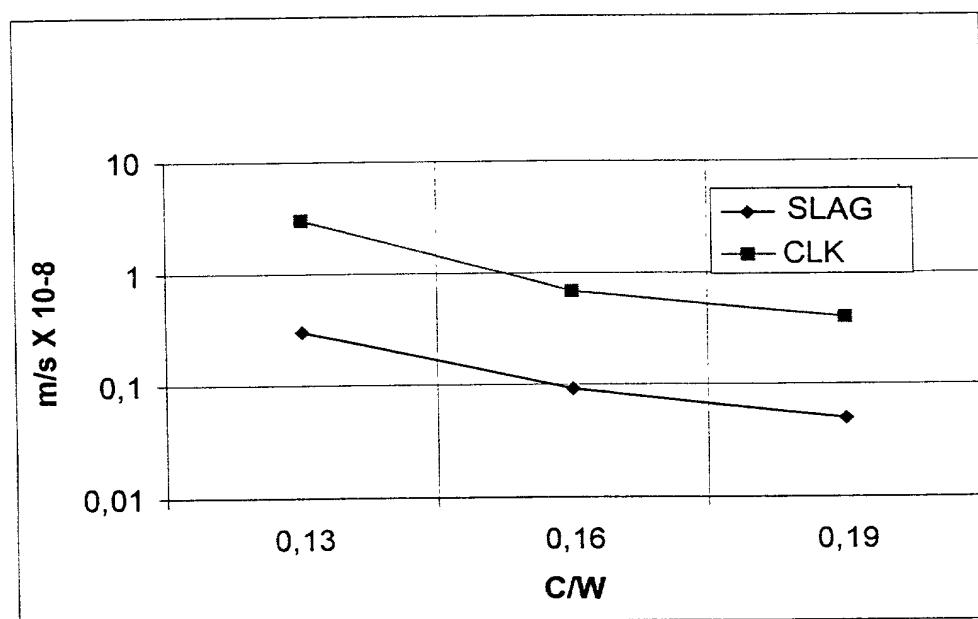


FIG. 1

MERCHANT &amp; GOULD P.C.

## United States Patent Application

## COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: GROUT FOR MAKING WATERTIGHT SCREENS

The specification of which

- a.  is attached hereto
- b.  was filed on \_\_\_\_\_ as application serial no. \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable) (in the case of a PCT-filed application) described and claimed in international no. \_\_\_\_\_ filed \_\_\_\_\_ and as amended on \_\_\_\_\_ (if any), which I have reviewed and for which I solicit a United States patent.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, § 1.56 (attached hereto).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

- a.  no such applications have been filed.
- b.  such applications have been filed as follows:

FOREIGN APPLICATION(S), IF ANY, CLAIMING PRIORITY UNDER 35 USC § 119			
COUNTRY 	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)
France	99 13126	21 October 1999	

ALL FOREIGN APPLICATION(S), IF ANY, FILED BEFORE THE PRIORITY APPLICATION(S)			
COUNTRY 	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)

I hereby claim the benefit under Title 35, United States Code, § 120/365 of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. APPLICATION NUMBER	DATE OF FILING (day, month, year)	STATUS (patented, pending, abandoned)

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

U.S. PROVISIONAL APPLICATION NUMBER	DATE OF FILING (Day, Month, Year)

I hereby appoint the following attorney(s) and/or patent agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith:

Albrecht, John W.	Reg. No. 40,481	Leon, Andrew J.	Reg. No. 46,869
Ali, M. Jeffer	Reg. No. 46,359	Leonard, Christopher J.	Reg. No. 41,940
Anderson, Gregg I.	Reg. No. 28,828	Liepa, Mara E.	Reg. No. 40,066
Batzli, Brian H.	Reg. No. 32,960	Lindquist, Timothy A.	Reg. No. 40,701
Beard, John L.	Reg. No. 27,612	Lycke, Lawrence E.	Reg. No. 38,540
Berns, John M.	Reg. No. 43,496	McAuley, Steven A.	Reg. No. 46,084
Black, Bruce E.	Reg. No. 41,622	McDonald, Daniel W.	Reg. No. 32,044
Branch, John W.	Reg. No. 41,633	McIntyre, Jr., William F.	Reg. No. 44,921
Bremer, Dennis C.	Reg. No. 40,528	Mitchem, M. Todd	Reg. No. 40,731
Bruess, Steven C.	Reg. No. 34,130	Mueller, Douglas P.	Reg. No. 30,300
Byrne, Linda M.	Reg. No. 32,404	Nichols, A. Shane	Reg. No. 43,836
Campbell, Keith	Reg. No. P-46,597	Pauly, Daniel M.	Reg. No. 40,123
Carlson, Alan G.	Reg. No. 25,959	Phillips, Bryan K.	Reg. No. P-46,990
Caspers, Philip P.	Reg. No. 33,227	Phillips, John B.	Reg. No. 37,206
Chiapetta, James R.	Reg. No. 39,634	Plunkett, Theodore	Reg. No. 37,209
Clifford, John A.	Reg. No. 30,247	Prendergast, Paul	Reg. No. 46,068
Coldren, Richard J	Reg. No. 44,084	Pytel, Melissa J.	Reg. No. 41,512
Daignault, Ronald A.	Reg. No. 25,968	Qualey, Terry	Reg. No. 25,148
Daley, Dennis R.	Reg. No. 34,994	Reich, John C.	Reg. No. 37,703
Dalglish, Leslie E.	Reg. No. 40,579	Reiland, Earl D.	Reg. No. 25,767
Daulton, Julie R.	Reg. No. 36,414	Samuels, Lisa A.	Reg. No. 43,080
DeVries Smith, Katherine M.	Reg. No. 42,157	Schmaltz, David G.	Reg. No. 39,828
DiPietro, Mark J.	Reg. No. 28,707	Schuman, Mark D.	Reg. No. 31,197
Edell, Robert T.	Reg. No. 20,187	Schumann, Michael D.	Reg. No. 30,422
Epp Ryan, Sandra	Reg. No. 39,667	Scull, Timothy B.	Reg. No. 42,137
Glance, Robert J.	Reg. No. 40,620	Sebald, Gregory A.	Reg. No. 33,280
Goggins, Matthew J.	Reg. No. 44,125	Skoog, Mark T.	Reg. No. 40,178
Golla, Charles E.	Reg. No. 26,896	Spellman, Steven J.	Reg. No. 45,124
German, Alan G.	Reg. No. 38,472	Stoll-DeBell, Kirstin L.	Reg. No. 43,164
Gould, John D.	Reg. No. 18,223	Sumner, John P.	Reg. No. 29,114
Gregson, Richard	Reg. No. 41,804	Swenson, Erik G.	Reg. No. 45,147
Gresens, John J.	Reg. No. 33,112	Tellekson, David K.	Reg. No. 32,314
Hamer, Samuel A.	Reg. No. 46,754	Trembath, Jon R.	Reg. No. 38,344
Hamre, Curtis B.	Reg. No. 29,165	Tuchman, Ido	Reg. No. 45,924
Harrison, Kevin C.	Reg. No. P-46,759	Underhill, Albert L.	Reg. No. 27,403
Hertzberg, Brett A.	Reg. No. 42,660	Vandenburgh, J. Derek	Reg. No. 32,179
Hillson, Randall A.	Reg. No. 31,838	Wahl, John R.	Reg. No. 33,044
Hölzer, Jr., Richard J.	Reg. No. 42,668	Weaver, Karrie G.	Reg. No. 43,245
Johnston, Scott W.	Reg. No. 39,721	Welter, Paul A.	Reg. No. 20,890
Kadievitch, Natalie D.	Reg. No. 34,196	Whipps, Brian	Reg. No. 43,261
Kanjoker, Shaukat	Reg. No. 34,049	Whitaker, John E.	Reg. No. 42,222
Kastelic, Joseph M.	Reg. No. 37,160	Wickhem, J. Scot	Reg. No. 41,376
Kettelberger, Denise	Reg. No. 33,924	Williams, Douglas J.	Reg. No. 27,054
Keys, Jeramie J.	Reg. No. 42,724	Withers, James D.	Reg. No. 40,376
Knearl, Homer L.	Reg. No. 21,197	Witt, Jonelle	Reg. No. 41,980
Kowalchyk, Alan W.	Reg. No. 31,535	Wu, Tong	Reg. No. 43,361
Kowalchyk, Katherine M.	Reg. No. 36,848	Xu, Min S.	Reg. No. 39,536
Lacy, Paul E.	Reg. No. 38,946	Zeuli, Anthony R.	Reg. No. 45,255
Larson, James A.	Reg. No. 40,443		

I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/ organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Merchant & Gould P.C. to the contrary.

Please direct all correspondence in this case to Merchant & Gould P.C. at the address indicated below:

Merchant & Gould P.C.  
P.O. Box 2903  
Minneapolis, MN 55402-0903



I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2	<b>Full Name Of Inventor</b>  VATTEMENT	<b>First Given Name</b> Hubert	<b>Second Given Name</b>
0	<b>Residence &amp; Citizenship</b>  City Montereau	<b>State or Foreign Country</b> France	<b>Country of Citizenship</b> France
1	<b>Post Office Address</b>  Post Office Address 20ter Boulevard des Messieurs	<b>City</b> Montereau	<b>State &amp; Zip Code/Country</b> 77130 France
<b>Signature of Inventor 201:</b>		<b>Date:</b>	

## § 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

- (1) prior art cited in search reports of a foreign patent office in a counterpart application, and
- (2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

- (1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim;
- (2) It refutes, or is inconsistent with, a position the applicant takes in:
  - (i) Opposing an argument of unpatentability relied on by the Office, or
  - (ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

- (c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:
  - (1) Each inventor named in the application;
  - (2) Each attorney or agent who prepares or prosecutes the application; and
  - (3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.
- (d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.